National Institute of Environmental Health Sciences

Effects of climate on West Nile virus transmission risk used for public health decision-making in Quebec

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Abstract:

Background: In 2002, major human epidemics of West Nile Virus (WNV) were reported in five cities in the North East region of North America. The present analysis examines the climatic conditions that were conducive to the WNV epidemic, in order to provide information to public health managers who eventually must decide on the implementation of a preventive larvicide spraying program in Quebec, Canada. Two sets of variables, the first observed in the summer of 2002 and the second in the preceding winter were analysed to study their potential as explanatory variables for the emergence of the virus at epidemic levels. Results: Results show that the climatic conditions observed in the year 2002 have contributed to the emergence of the virus and can be observed once every forty years on average. The analysis has shown that the 2002 events observed in several North East North American cities are characterized by two main variables: the number of degree-days below -5°C in the winter (DD-5) and the number of degree-days greater than 25°C in the summer (DD25). Conclusion: In the context of a declining rate of human and aviary infection to WNV, this element contributed to the decision to suspend the use of preventive larvicides in the province of Quebec in 2006 and for the foreseeable future. The second part of this study indicates that it is very important to estimate the risk that extreme values can be observed simultaneously in the summer and in the winter preceding the appearance of the virus. The proposed models provide important information to public health officials, weeks before the appearance of the virus, and can therefore be useful to help prevent human epidemics.

Source: Ask your librarian to help locate this item.

Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience:

audience to whom the resource is directed

Health Professional

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Temperature

Temperature: Fluctuations

Geographic Feature:

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: West Nile Virus

Medical Community Engagement:

resource focus on how the medical community discusses or acts to address health impacts of climate change

A focus of content

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology:

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type:

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content